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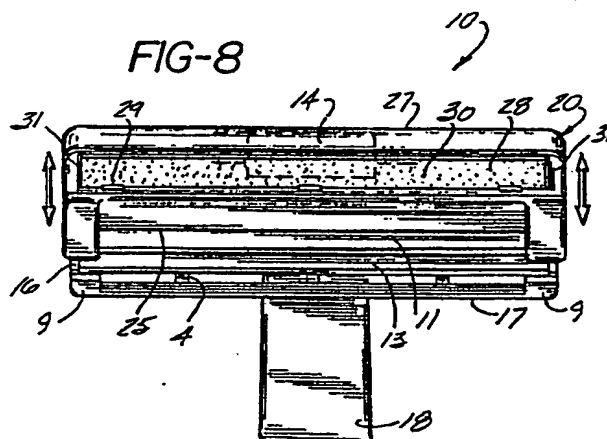
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(54) **Razor Head.**

(57) A razor head (10) comprising a blade support (5), at least one blade (11, 13) disposed above the blade support (5) and a cap (20) disposed above the or each blade (11, 13). The cap (20) and blade support (5) are movable relative to each other between a first position in which the or each blade (11, 13) is exposed and a second position in which the or each blade (11, 13) is covered. A shaving aid (30) is provided which is disposed in a position for engaging a face when the cap (20) and support (5) are in the first position.



## Description

## RAZOR HEAD

This invention relates to a razor head. More particularly this invention relates to a razor head having a blade protective cover.

Recently, disposable razors have been manufactured in which the razor cap also serves as a blade protective cover. This is accomplished by moving either the cap relative to the blade and blade support, or by moving the blade and blade support relative to the cap, so that either the cap or the support can be locked in place in two positions; the first position places the cap forward of the blade to protect it when the razor is being stored, and in the second position the cap is retracted from the blade edge exposing the edge for shaving.

US-A-4,328,615 and US-A-4,443,938 describe a razor in which the cap moves relative to the blade support surface and locks in the blade protective position as well as the blade exposed position. This is accomplished by extending the cap sides downward over the blade support, with lugs protruding inward from the cap sides to engage suitable mating elements in the blade support sides.

One of the mating elements is a slide surface which engages one of the lugs and defines the linear movement of the cap. Another lug engages a series of spaces defined by projections in the forward portion of the side of the seat. The projections and the lug form two detent positions. One of the detent positions locks the cap in its retracted-blade exposed position, while the other, when the lug is engaged with it, locks the cap in the blade protective position. This configuration allows the cap to serve as a protective cover and does so without any additional elements or substantial modification in disposable razor design. Problems have, however, been encountered in moulding the side of the blade support portion particularly the side flanges.

GB-A-2,113,594 describes a razor having a pivotal blade support which is anchored along the sides of the cap; the cap and handle are formed as a single piece. The blade support, as it pivots through its arc, moves the blades forward to expose the blades at a counter clockwise-most position and rearward to shield the blades at a clockwise-most position. Detenting means are provided by a finger which extends outward from the rear of the blade support portion and engages either in a mating slot on the cap, or in a downward extending cap lip. The former position provides a locking detent exposing the blade while the latter provides a locking detent for blade protection. The finger is centrally positioned along the razor head and tends to wear during use; as a result, the first (i.e. covered) locking position tends to produce a set which loses its firm positioning in its socket. Also, pivoting occurs as a result of the mating of the separate blade support with the one piece cap-side-handle configuration and precise internal measurements are needed for the lugs on the sides of the inserted platform to engage the receiving slots at the sides of the one-piece configuration. These relatively small lugs

can be broken off by the force applied during insertion.

US-A-4,464,835 describes a razor with a movable cap, the cap being positioned by a central ramp detent.

US-A-4,170,821 describes the addition to a razor head of a shaving aid in the form of a lubricant, whisker softener razor cleaner, medicinal agent or the like. This patent also describes a water soluble lubricant such as polyethylene oxide which is leachable from a microporous substrate applied as part of the cap.

According to the present invention there is provided a razor head characterised by a blade support, at least one blade disposed above the blade support and a cap disposed above the or each blade, said cap and blade support being movable relative to each other between a first position in which the blade is exposed and a second position in which the blade is covered, and a shaving aid is disposed in a position for engaging a face when the cap and support are in the first position.

Advantageously the shaving aid is a facial lubricant.

Desirably the shaving aid contains polyethylene oxide.

Preferably the shaving aid comprises a shave-aiding agent and an insoluble microporous retaining structure for said shave-aiding agent.

Preferably also the shave-aiding agent can be leached out of said retaining structure.

The shaving aid may be held in place by tabs positioned along the periphery of the shaving aid.

It is desirable that the shaving aid is moulded on the cap.

The shaving aid can also include at least one member selected from the group consisting of emollients, antiseptics, astringents, acne treatments, sun screen containing solutions and scented solutions.

The the shaving aid is preferably provided on the cap.

According to another aspect of the invention, there is provided a disposable razor comprising a razor head as described above and a handle integral with said razor head.

Examples of shave-aiding agents which can be applied during shaving are polyethylene oxide, certain silicones and other lubricating agents, as disclosed in US-A-4,170,821. These shave-aiding agents act as a lubricant and provide a barrier between the blades and the face after the blades have made their initial pass to remove shaving cream. Shavers invariably shave the same location repeatedly to pick up hairs that were missed during the initial stroke where the face was covered with lather. The idea of presenting such a lubricating barrier is generally disclosed in US-A-4,170,821. However, due to the ability to use the razor of this invention as an applicator, the lubricant can be applied without the face being in direct contact with

the blades. This enables the user to put down a secondary coating of lubricant before a subsequent blade stroke as well as during the blade stroke. Other agents which may be added to the strips, alone or in combination with lubricants, are bacteriostats or other antiseptics, suntan lotions containing for example, para aminobenzoic acid, benzoyl 6-peroxide, after shave lotions, emollients and cologne.

Furthermore, since the use is designed to be correlated with the repeated shaves inherent in current blade technology, a timed release feature such as disclosed in US-A-4,170,821 or GB-A-2,427,184 is desired. A preferred way to accomplish timed release is to imbed the materials to be released, which should be water soluble, into a microporous strip by processes such as that disclosed in US-A-3,075,033 and US-A-3,181,973. These patents disclose the concept of leaching a water soluble material, particularly poly-ethylene oxide, from a water insoluble microporous matrix comprising, for example, a thermoplastics material such as polystyrene. The combination of the polyethylene oxide and polystyrene or other thermoplastics material is formed either by extruding the polyethylene-oxide and thermoplastics material together or by injection moulding them together in the strip. Delivery levels suitable for repeated shaving is obtained when the percentage of polyethylene oxide by weight is between 30 and 80% and generally between about 40 and 70% of the mixture with the thermoplastics material.

A particularly preferred method of uniting the strip to the cap is by sequential moulding wherein an injection moulded cap is formed with a suitable recessed area covered by a suitable portion of the mould. The covering portion is withdrawn and the mating strip is formed in place in the mould generally attached by suitable slots formed in the recessed area which engage mating anchors extending downward from the strip when the moulding in place occurs. The recess should provide a rearward stop to receive shaving forces as is the case with the structure wherein the strip is added on the attached by being held in place by a rearward wall.

After the cap has been moulded a second moulding step generally at temperatures below the first moulding step occurs utilizing the cap as a substrate for a mouldable blend of thermoplastics material and shave-aiding agent. During the second moulding step the mixture is shaped into a solid which conforms to and is attached to the recess and slots in the cap formed during the first moulding.

For purposes of this invention the term "shaving aid" includes compositions which are used during or after shaving. The definition also includes delivery systems for shave-aiding agents, such as microporous strips or microencapsulated strips as disclosed in US-A-4,170,822.

The shaving aid may be a solid which is partially or entirely water soluble; it is preferred that the shaving aid is partially water soluble.

Since it is desired that the delivery system be small, self contained and process compatible with the manufacturer of disposable plastic razors, the

utilization of complex delivery systems such as required for shaving creams or foams is specifically excluded from the ambit of this invention. By using a delivery system e.g. microporous water insoluble strips, the delivery system can be sequentially moulded or attached to the cap and the disposable razor can be made with minimal cost increase. This is not possible when large volumes of material are to be added to the face such as occurs with the addition of shaving cream or foam.

It is particularly preferred that the strip be positioned so as to have minimal effect on shaving geometry when it is designed to contact the face, and therefore it should be positioned either with a recess in the cap so that only the surface is exposed or the surface should only be slightly elevated above the cap. This restricts the size and capacity of the delivery system and therefore eliminates the possibility of delivering shaving creams or foams in this manner. It is also preferred that the plane of the strip be essentially that of the cap or, alternatively that the rearward portion be higher than the frontward portion. Of course, by making the retaining structure of the shaving aid water insoluble, the shaving geometry will not change through repeated use of the razor.

Reference is now made to the accompanying drawings, in which:-

Figure 1 is a side view of a disposable razor having a razor head according to the invention;

Figure 2 is a plan view of a blade support of the razor head according to the invention;

Figure 3 is a side view of a razor head according to the invention with the sliding cap removed;

Figure 4 is a plan view of the razor head shown in Figure 3;

Figure 5 is a front elevation of a cap for use with a razor head according to the invention;

Figure 6 is a view from below of the cap shown in Figure 5;

Figure 7 is a cross-section of a razor head according to the invention; and

Figure 8 is a plan view of the razor head according to the invention.

The razor head depicted and discussed below is similar to that described in US-A-4,464,935 and is preferred as an embodiment of a razor head with a blade exposed and blade covered configuration because of its simplicity and ease of manufacture. It is to be understood that, for purposes of this invention, any of the prior art razors which produce a blade covered and blade exposed locking configuration such as those found in US-A-4,443,938, US-A-4,328,615 and GB-A-2,113,594 are also useful.

As shown in Figure 1, a disposable razor 10 has a handle 18 extending upward so that it joins a razor head having cap 20 and a blade support 5 (see also Figure 3). The razor head also includes upper and lower blades 11 and 13 separated by a spacer 12. The support 5 acts as a seat for the blades 11 and 13.

The cap 20 is slidable relative to the blade support 5 between a position in which the blades 11 and 13 are exposed for shaving, and a position in which blades 11 and 13 are shielded.

As can be seen further with reference to Figures 1 and 8, a shaving aid 30 is present on the razor 10 in a face engaging relationship so that when the blades 11 and 13 are exposed for shaving, the shaving aid 30 can contact the face.

The blade support 5 as shown in Figure 2, includes upwardly extending circular support surfaces 7 and pins or stakes 6 centrally positioned and upwardly depending from surfaces 7. The pins 6 hold the upper blade 11, the lower blade 13 and the spacer 12, and define spatial relationships through slots 19 at the right and left hand side of the upper blade 11 (see Figure 4). Corresponding slots exist in the lower blade 13, and holes corresponding to the size of the pins 6 are provided in the spacer 12. The pins 6 extend upward from the bottom of lower blade 13 (which is wider than top blade 11), through the holes (not shown) in the spacer 12. The pins 6 are positioned by to fit through the slots 19 and through a central slot 15 in the upper blade 11 (see Figures 3 and 4).

As shown in Figure 2, a guard bar 17 is attached to the blade support 5 by forwardly extending ribs 4. The edge of the guard bar 17 forms a raised area (see Figures 2, 3 and 4) which shields the corner of the blade 13 and also defines a forward wall stop for the sliding movement of the cap 20. As can best be seen by reference to Figure 3, a projection 8, upstanding from a ledge 16, provides a rearward stop for the sliding movement of the cap 20.

As can best be seen by reference to Figures 5, 6, 7 and 8, the cap 20 has sides 26 with a pair of inwardly extending flanges 22; the blade support 5 is received between the sides 26 which surround partially the blade support 5. The cap 20 is designed to move essentially linearly and reciprocally over the subassembly of the support 5 and the blades 11 and 13.

A rearwardly extending lip 27, provided on the rear of the cap 20, engages projection 14 provided on the support 5. Ramp faces 14a and 14b are provided on opposite sides of the projection 14. When the lip 27 engages the bottom of the downwardly extending ramp face 14b the blades 11 and 13 are exposed for shaving (see Figure 7). The cap 20 has a series of recesses 23 which correspond to upstanding posts 6 on the support 5 to provide clearance for movement.

When cap lip 27 is in the position shown in phantom lines in Figure 7, it abuts against the upwardly extending ramp face 14a; the upward ramp face 14a serves as a detent for the bottom of the cap lip 27.

The blades 11 and 13 are exposed by exerting rearward pressure against the cap 20 and the cap sides 26, which allows the cap lip 27 to ride up and over upward ramp face 14a and downward ramp face 14b. To assist with this the cap lip is preferably resiliently deformable.

As can best be seen by reference to Figures 7 and 8, the shaving aid 30 is positioned on the top portion of the cap 20 and is in the form of a strip; the shaving aid 30 is held in place by forwardly positioned ribs 29 and rearwardly positioned wall 28. The strip 30 is prevented from sliding transversely across the cap 20 by the presence of fins 31 disposed at each end

thereof. The wall 28 is used to prevent dislodgement by shaving forces directed against the strip 30 in the rearward direction.

As explained above, the shaving aid 30 may be an insoluble microporous material having one or more shave-aiding agents provided therein. When the shave-aiding agents are materials which it may be desirable to add to the skin during shaving (e.g. polyethylene oxide, and emollients or similar skin conditioners) then the positioning of the shaving aid shown in Figure 8 is particularly suitable.

The shave-aiding agent of the shaving aid 30 can be applied to the skin during the shaving action when the cap 20 is in the exposed position shown in Figure 8. The shave-aiding agent of the shaving aid 30 can also be applied to the skin when the cap 20 is in the shielded position.

The shaving aid 30 can be considered to act as a skin-treating component.

## Claims

1. A razor head characterised by a blade support, at least one blade disposed above the blade support and a cap disposed above the or each blade, said cap and blade support being movable relative to each other between a first position in which the or each blade is exposed and a second position in which the or each blade is covered, and a shaving aid which is disposed in a position for engaging a face when the cap and support are in the first position.

2. A razor head according to Claim 1, characterised in that the shaving aid is a facial lubricant.

3. A razor head according to Claim 1 or 2, characterised in that the shaving aid contains polyethylene oxide.

4. A razor head according to any preceding claim, characterised in that the shaving aid comprises a shave-aiding agent and an insoluble microporous retaining structure for said shave-aiding agent.

5. A razor head according to Claim 4, characterised in that the shave-aiding agent can be leached out of said retaining structure.

6. A razor head according to any preceding claim, characterised in that said shaving-aid is held in place by tabs positioned along the periphery of said shaving-aid.

7. A razor head according to any preceding claim, characterised in that the shaving-aid is provided on the cap and is preferably moulded on the blade cap.

8. A razor head according to any preceding claim, characterised in that the shaving-aid includes at least one member selected from the group consisting of emollients, antiseptics astringents, acne treatments, sun screen containing solutions and scented solutions.

9. A disposable razor comprising a razor head according to any preceding claim and a

handle integral with said razor head.

10. A disposable razor according to Claim 9, wherein the or each blade and the blade support are movable relative to the cap and the handle, or the cap is movable relative to the or each blade, the blade support and the handle.

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FIG-1

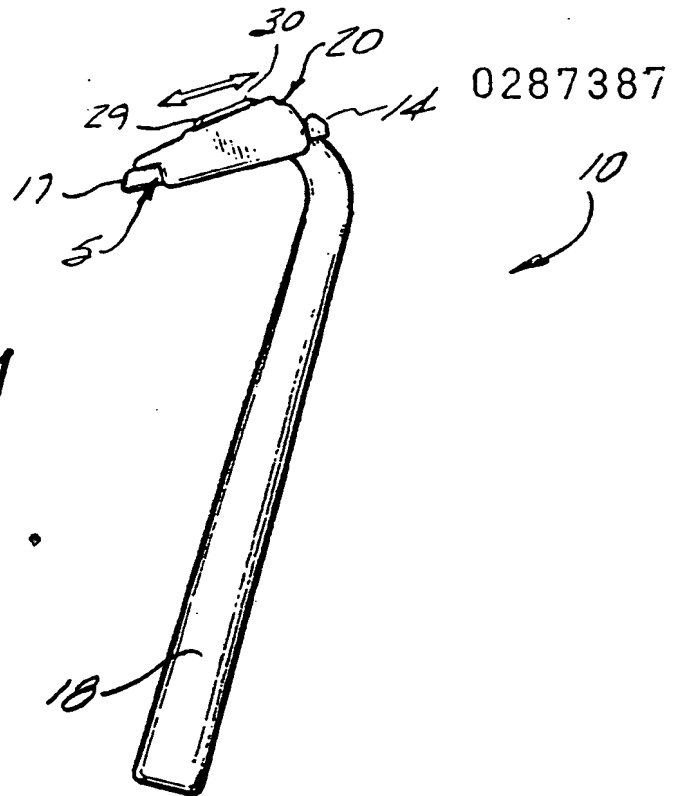
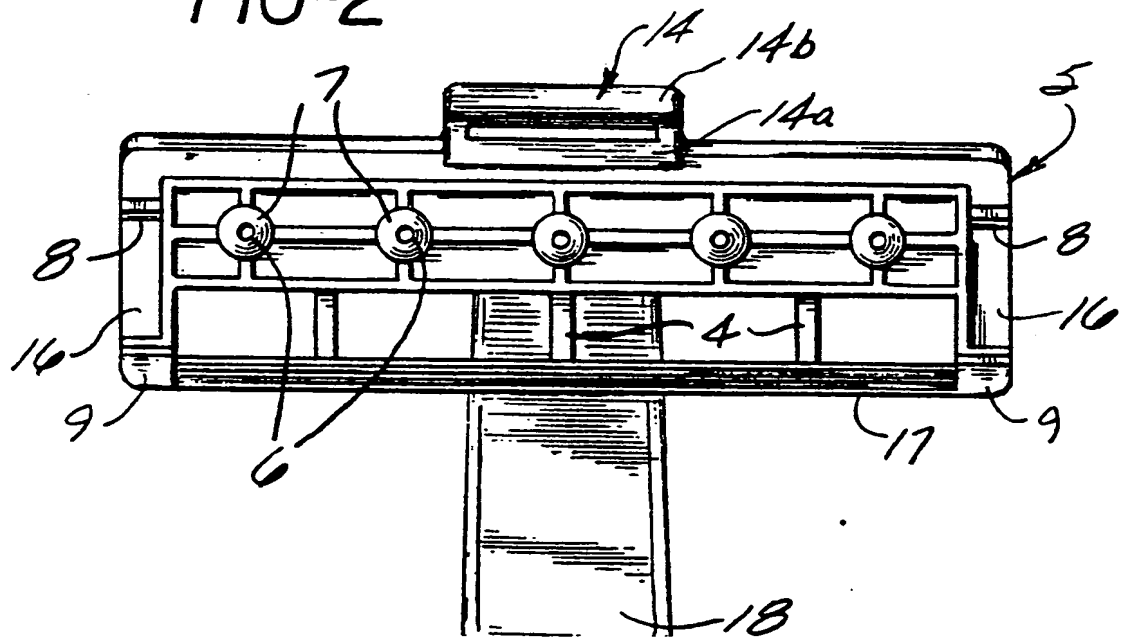


FIG-2



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FIG-3

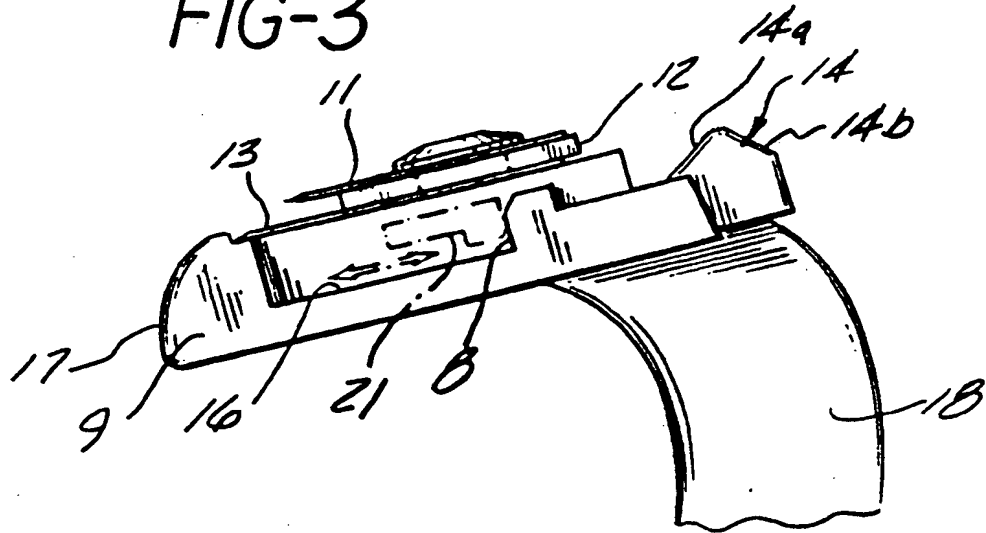
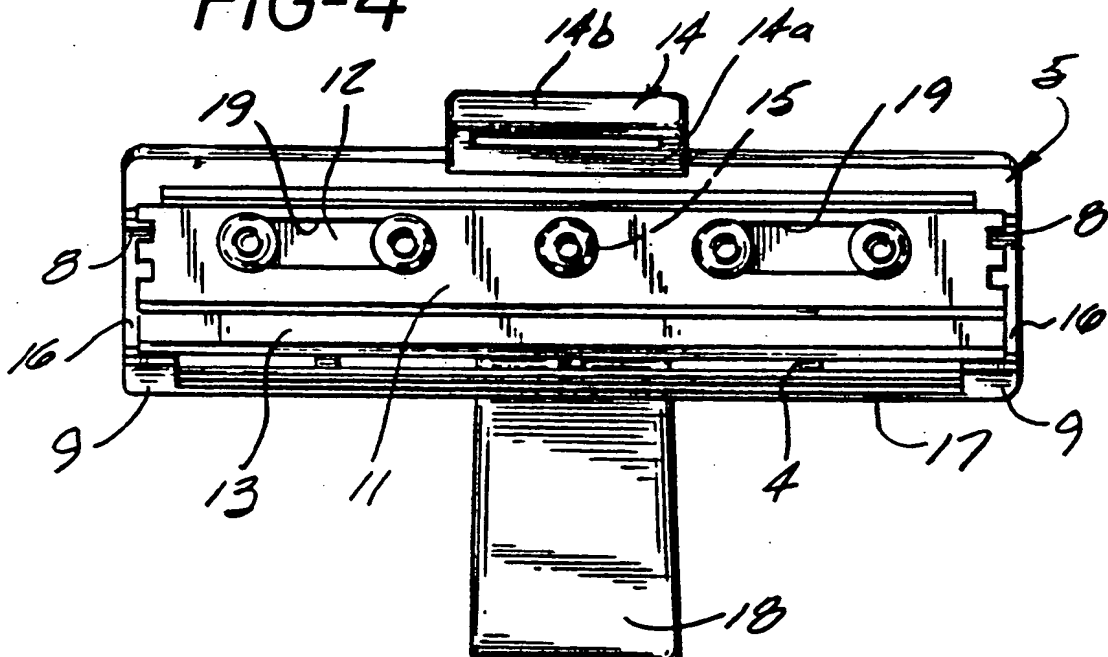
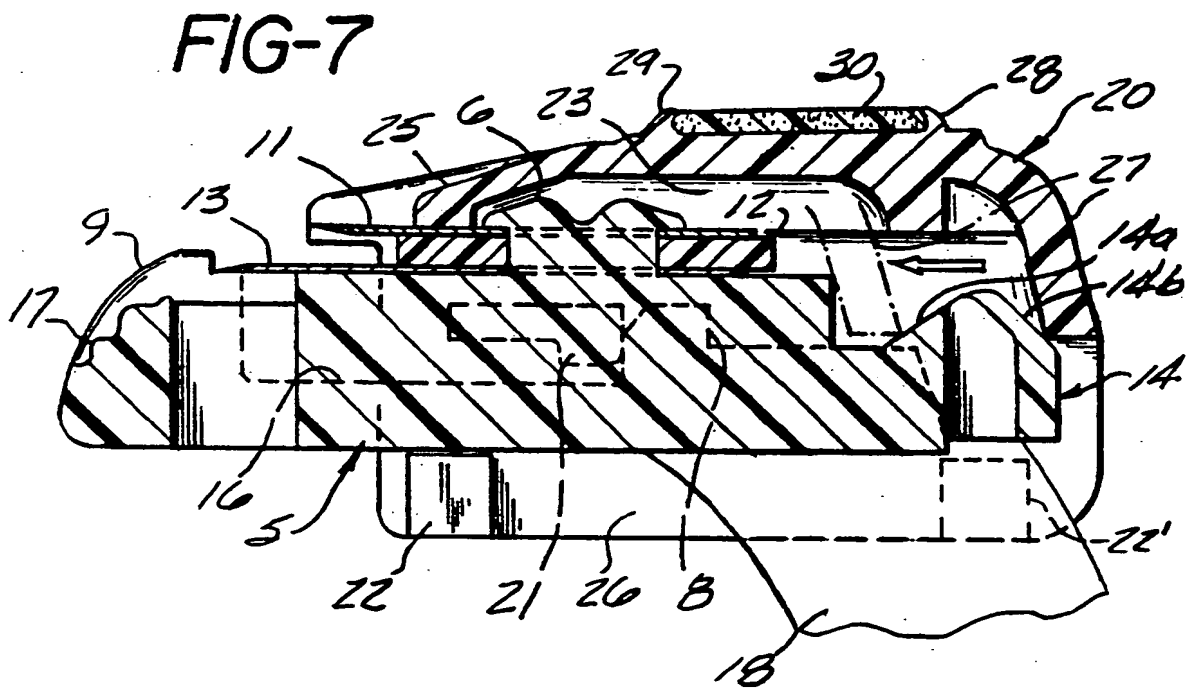
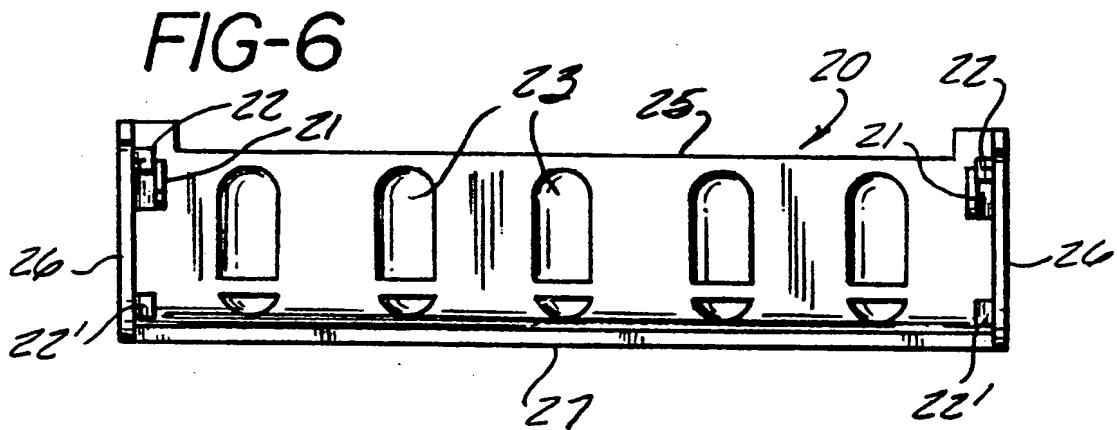
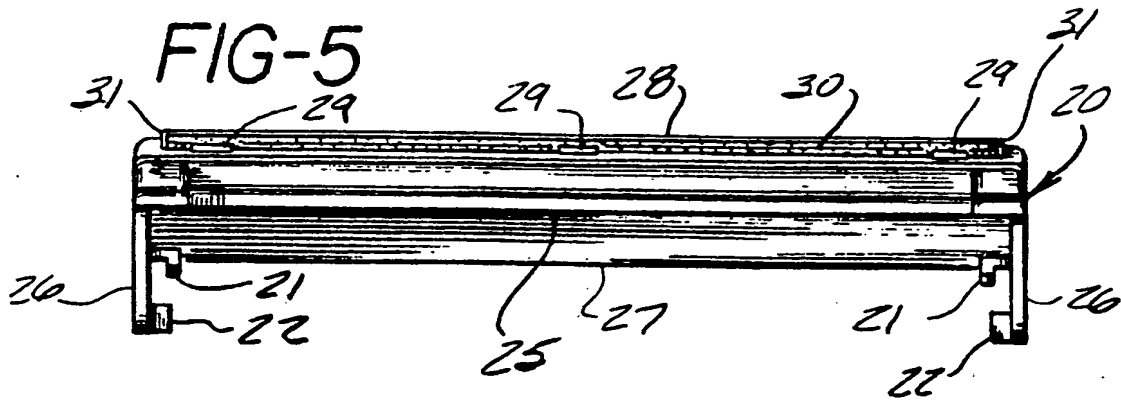


FIG-4



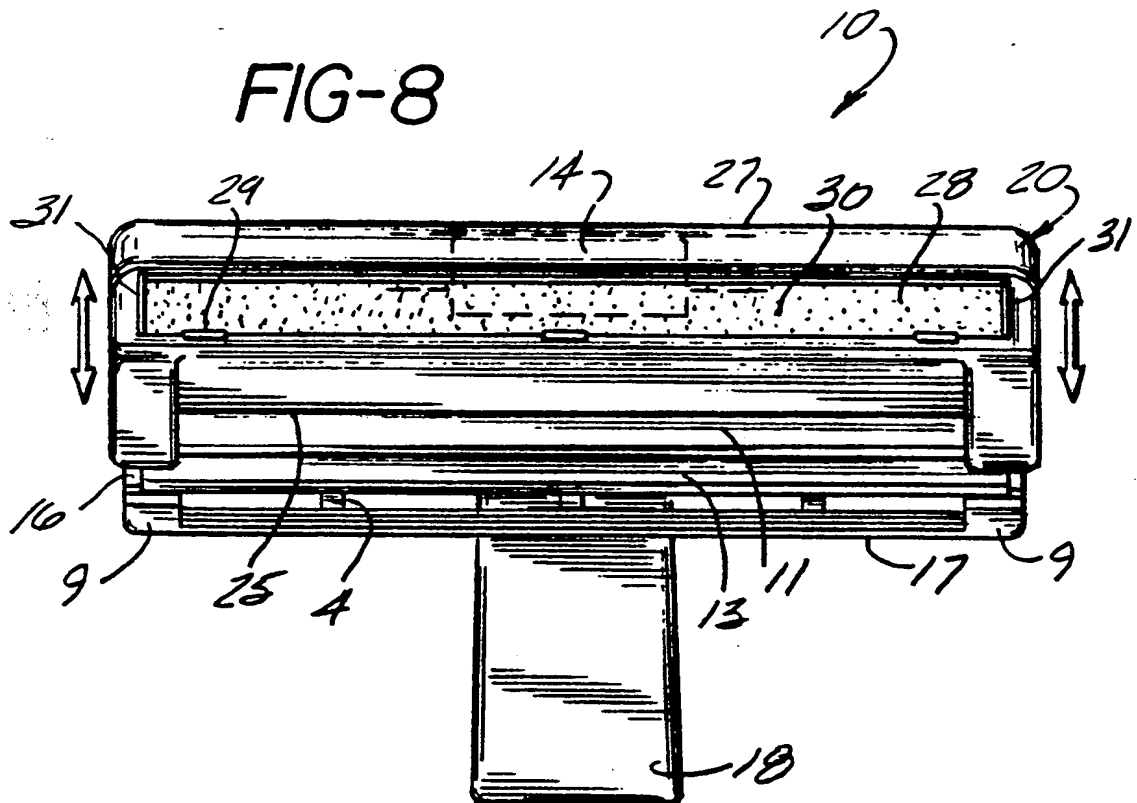
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FIG-8





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# EUROPEAN SEARCH REPORT

Application Number

EP 88 30 3413

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	GB-A-2 100 650 (WARNER-LAMBERT CO.) * Pages 1,2; figures 1,2,3 *	1-10	B 26 B 21/44 B 26 B 29/00
Y	GB-A-2 024 082 (THE GILLETTE CO.) * Pages 1,2,3; figures 4,8 *	1-10	
Y	US-A-4 257 160 (Y. MURAI) * Column 3, lines 13-60; figures 2,3 *	1,2,4,5 ,7,8,10	
Y	GB-A-1 157 640 (CALMIC LTD) * Page 3, line 67 - page 4, line 13; figures 1,2 *	1,2,4,5 ,7,8,10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 26 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21-07-1988	Examiner WOHLRAPP R.G.
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